changes over a few years. It seems that with the close similarity in morphological changes associated with the late brood that a reasonably uniform mechanism is the cause of the phenomenon. It would be valuable to collect environmental data from these and surrounding colonies, from the macro scale of lithology, climatic data and notes on available foodplants *et cetera* in case these indicate effective forces; to detailed work on the differences through the flight period in the insects themselves.

It must be obvious by now, that there is a further possibility. The selection may not be in the mid part of the flight period at all, but may operate as selective selection on certain genotypes in the larval stage say; and the genotypes removed may be pleiotropic for the selective factor and mid flight emergence; i.e. the mid flight period emergence types (controlled by certain genotypes) may also be susceptible to selection pressures of a different nature much earlier in their existence, effecting the same genotypes. So it is wise to remember that in the diagram it is the *effect* of the selection barrier in the mid part of the flight period, though the selection itself may be operating at some other time of the year on a different stage of metamorphosis. On this note, the subject may for the moment be closed.

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A Review of the Butterflies of the Bristol Area

by A. D. R. Brown

(continued from p. 108)

Argynnis paphia Linn. (Silver Washed Fritillary)

Although the Silver Washed Fritillary is on the decline generally in the rest of the country, the signs are most encouraging in West Gloucestershire. Its potential in the Forest of Dean is tremendous, and we know of several good sightings from the areas around Monmouth. The situation is the same along the wooded areas of the Cotswold Hills, and we are just beginning to discover new haunts where it had previously been overlooked. In the Nature Reserve at Wetmoor, it is seen in most years but is not common.

Individual specimens have been seen from time to time at several places in North Somerset, but its future prospects do not look so good. It is probable that many of these isolated specimens have originated from the deciduous woodlands near Tickenham, but the M5 motorway development scheme has recently devastated this region. Once again, Goblin Combe is another well known locality for this species, but its numbers vary from one year to the next.

Argynnis aglaia Linn. (Dark Green Fritillary)

This species is more widely distributed than the previous one owing to the larger areas of its habitat. In places such as Dursley and Wotton-under-Edge in the Cotswolds, it is seen most years, but its numbers appear to vary. We know of many more localities in North Somerset, especially in the Mendip Hills where it is particularly fond of the rough marshy pastures around the deserted lead mines. Occasionally, extreme melanic specimens have been captured here, but none have been taken in recent years. Goblin Combe provides another ideal habitat for the Dark Green Fritillary, and this butterfly is seen here in strength every year. During 1970 some superb dark females were observed, not unlike sub-species *scotica* from northern Scotland. Reports are frequently received of observations from the coastal stretches near Brean, as well as from the hills behind Clevedon. We rarely find records or discoveries of new localities, since most of our material is repetitive from one season to the next. As far as can be made out the status of this species is somewhat static at this time in the West of England.

Argynnis cydippe Linn. (High Brown Fritillary)

The only locality known at present in either of the two vice-counties is Goblin Combe in North Somerset. It is extremely likely that the High Brown Fritillary occurs in the Forest of Dean and various other places, but a good deal of work in this line has yet to be done. It is highly probable that many of our records of the Dark Green Fritillary (*Argynnis aglaia* Linn.) have been mistaken for this species, as this confusion commonly arises. In Goblin Combe itself, it is quite scarce and never more than three specimens have been recorded on any one occasion. This butterfly certainly needs all the protection it can get, and the problem is by no means a local one.

Vanessa atalanta Linn. (Red Admiral)

Many reports are received each year usually of individual specimens, but 1964 and 1969 stand out conspicuously, owing to the immense numbers of these butterflies which were observed during the late summer and autumns of those years. Clumps of Michaelmas Daisies and other plants were literally covered with them, and they stayed with us right up into the middle of November. It is worth noting that sightings of specimens seen on the wing during the early summer are seldom sent in, and so the apparent abundance now and again in the autumn brood may be due to the fine hot summer months of those years.

Vanessa cardui Linn. (Painted Lady)

Being also a regular migrant, the Painted Lady followed the example of the previous species and was especially abundant during the latter parts of 1964 and 1969. However, in

contrast we received many more reports of spring sightings, especially groups of butterflies moving northwards during May. These observations were concentrated from the North Somerset coast and along the Severn Estuary to Crook Peak, inland from Weston-super-Mare. On the whole, this species does not stay on the wing as long as the Red Admiral (*Vanessa atalanta* Linn.), since we have no reports from mid-November.

Aglais urticae Linn. (Small Tortoishell)

The Small Tortoishell butterfly, although common in most years, reaches a peak now and again during which time specimens have been counted in their hundreds. 1964 was one such year when it was probable that a third generation took place; in mid-September no fewer than 150 individuals were noted at Blagdon Lake in North Somerset, where they were visiting Water Mint flowers on the shore.

In 1968 a similar occurrence took place, and the butterflies 'swarmed' everywhere during the second generation. Earlier in the year larvae were to be found in profusion, and several good aberrations were bred from collected wild stock. Specimens remained on the wing throughout the autumn, and the last one was recorded from Charfield in Gloucestershire on 24th November.

Undoubtedly these peak emergences are due to the extra long fine hot summers experienced in those years.

Nymphalis io Linn. (Peacock)

This species too appears to be capable of sudden peaks, although judging from our records this phenomenon is far less frequent. It was observed fairly commonly throughout the 1960's, but was likewise affected by the hot summer of 1968. However, it was nothing like as plentiful as the Small Tortoishell (*Aglais urticae* Linn.) and the maximum number counted on any particular day was about fifty.

Nymphalis antiopa Linn. (Camberwell Beauty)

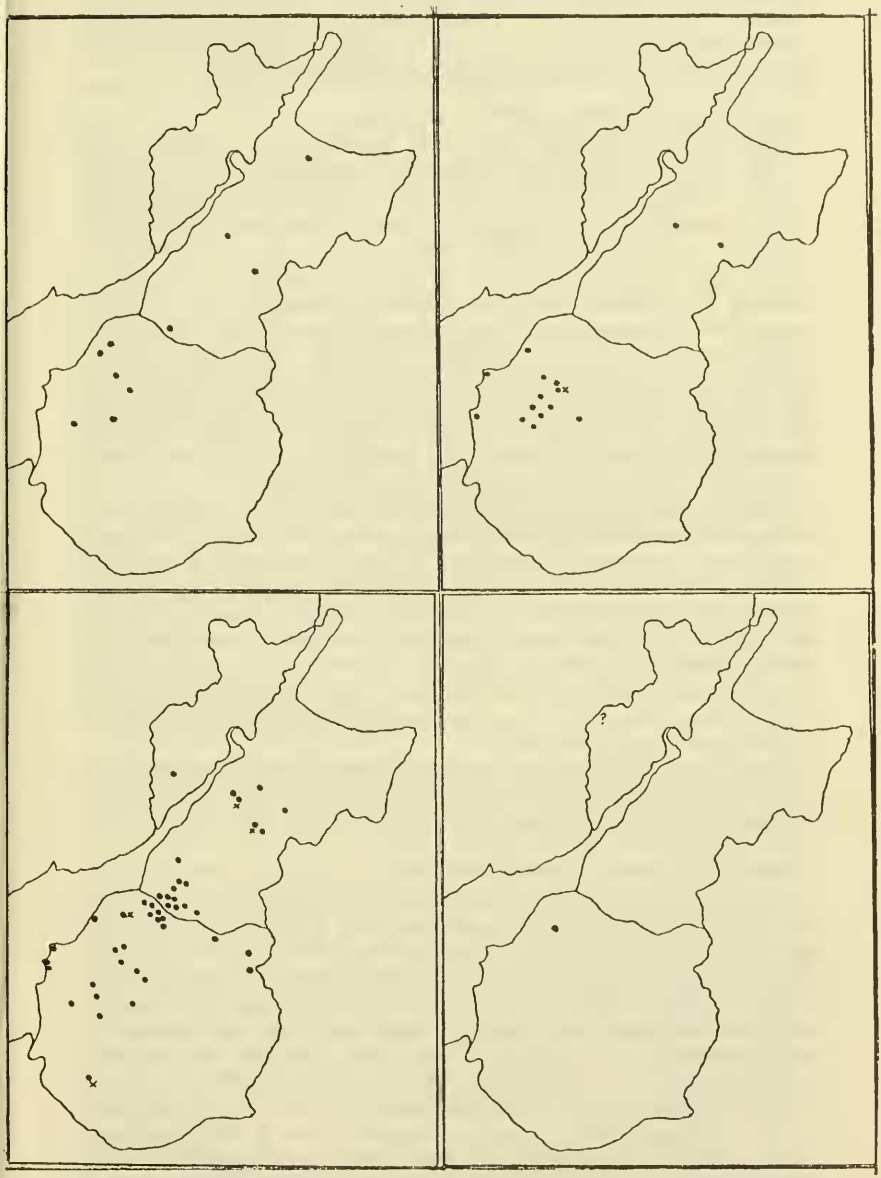
In 1966 we were fortunate enough to receive a report of this rare migrant from Scandinavia, when we heard that a single specimen had been found in a mercury vapour moth trap at Winscombe in North Somerset. This incident took place on 25th September, and it is of interest to note that there was a dense fog in the air that night, the visibility being down to fifty yards.

Polygonia c-album Linn. (Comma)

The status of the Comma remains practically constant at present, but fortunately, as in other parts of Britain, its distribution is increasing. This species is never common, and on average only one or two specimens are seen at a time. Occasionally, however, considerable numbers are met with, such as at Wetmoor in Gloucestershire on 17th April 1968, and again in Goblin Combe on 29th July of this year. In the Bristol area,

Argynnis paphia L.
(Silver Washed Fritillary)

· *Argynnis aglaia* L.
(Dark Green Fritillary)
x *Argynnis cydippe* L.
(High Brown Fritillary)



· *Polygonia c-album* L.
(Comma)
x *Limenitis camilla* L.
(White Admiral)

Apatura iris L.
(Purple Emperor)

the first specimens usually appear on the wing in early April following hibernation, and these then deposit their ova giving rise to the first generation in July. It is the butterflies from this first generation possessing the pale undersides that are known as ab. *hutchinsoni*. From August onwards the second generation is on the wing, and these may be around until late in October when they finally go into hibernation.

Limenitis camilla Linn. (White Admiral)

The White Admiral occurs in two places in each vice-county, but its survival is severely threatened. At Michael Wood in Gloucestershire it is still quite common, although the greater part of the original deciduous forest has been eradicated, as mentioned earlier. However, if steps are taken to protect the remaining habitat, there may still be a chance of keeping the species up to its previous strength. The conifer plantations here owned by the Forestry Commission, look quite mature now and could be felled at any time. This would mean clearing the undergrowth and brambles before widening the forest tracks, and this action would immediately exterminate the butterfly from this locality. About eight miles away at Wetmoor, the White Admiral is fortunately protected from such dangers, but it is by no means so plentiful.

The M5 motorway development scheme is also taking place in North Somerset, and a large portion of the Tickenham ridge near Clevedon, where the White Admiral is known to occur, has been blasted out by explosives, thus severing the hill completely in half. The damage that this has caused to the local flora and fauna has not yet been estimated, or whether this species has suffered. Down on the Somerset moors around Shapwick, an isolated specimen was observed a number of years ago, but no further records have been received since that time.

There are certainly many unexplored areas around the Bristol district where this butterfly might occur, and in particular the Forest of Dean.

Apatura iris Linn. (Purple Emperor)

Up until 1969 we had no reports whatsoever concerning this magnificent species, until the late Mr I. R. P. Heslop informed us that he had re-discovered it at one of its old haunts in North Somerset after a gap of fifty-one years. Due to the isolation of this habitat it is presumed that the Purple Emperor has survived there all this time, but has obviously been previously overlooked. The author visited the locality again this year, but no butterflies were seen. The area in question is quite inaccessible in places, where large oaks and other deciduous trees grow on the sides of a steep valley. Vertical cliffs protrude from the valley sides and these are adjacent to some deserted quarries, mostly overgrown. For some distance around the thick oak forest spreads out until the boundaries of the Forestry Commission's plantations take

over. From this it can be seen that the Purple Emperor could be flourishing anywhere within this region, and it is just a question of finding the master oak (or oaks).

There appear to be very few dangers to its future existence, the only real threat being the gradual encroachment of the Forestry Commission.

Up in Gloucestershire, the Purple Emperor used to be found at Symond's Yat near Monmouth, but has not been observed there in recent years. It is most likely, however, that it occurs elsewhere in the Forest of Dean at the present time. The author also has in mind one or two places east of the River Severn, but no systematic observations have yet been made.

(to be continued)

The Highlands: April 1971

By R. G. Chatelain and B. F. Skinner

We arrived at Struan at 6.30 on the morning of Easter Monday, 12th April, and within an hour had gathered a fresh series of *Lycia lapponaria scotica* Harr. of both sexes. The posts also yielded females of *Agriopis marginaria* Fab., *Achlya flavicornis scotica* Tutt. *Colostygia multistrigaria* Haw., a cocoon of *Cerura vinula* L. and, as a bonus, four fresh specimens of *Cleora cinctaria bowesi* Rich. This seemed a surprisingly early date as the bug would hardly have been out in its southern localities. Scotland was enjoying unusually warm weather and at Aviemore the usual selection of skiing outfits was enlivened by a few hardy souls in bathing suits and hot pants. In the afternoon on Granish, males of *Endromis versicolora* L. were flying with *Archiearis parthenias* L. and an early *Semiothisa carbonaria* Clerk.

That night we decided to let the static traps work for *Brachionycha nubeculosa* Esp. and to concentrate on the Scottish form of *Orthosia populeti* Fab. Accordingly, the portable lamps were set up in an aspen grove near Inshriach and we left to work the sallows south of Aviemore. These produced a fair number of moths, including *Orthosia incerta* Hufn. and *O. gothica* L. in great variety and several of the silvery-grey form of *Cerastis rubricosa* Schiff. The geometers were represented by *Tricopteryx carpinata* Borkh., some of them heavily banded, and plenty of *C. multistrigaria,* all past their best. On returning to the lamps, we were disappointed to find only one *O. populeti,* although five males *B. nubeculosa* were a pleasant sight. Next morning, the static traps situated to the north and south of Aviemore contained two more *nubeculosa* and many *Lycia hirtaria* Clerk., their ground colour ranging from white to deep yellow.

On 13th April, we returned to Struan for a further eight *C. cinctaria,* all within a restricted area. That night was cold, the thermometer at ground level registering −3°C and the only moths in the traps were a few *C. rubricosa.* Sallowing at